

REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Claims 10-12 have been cancelled. Claims 1, 4 and 6 have been amended, responsive to the rejection under 35 U.S.C. §112, to clarify that the other end of the hydrogen fluoride gas feed line is connected to a hydrogen fluoride gas inlet disposed in an electrolyte in an electrolytic bath, for feeding hydrogen fluoride gas into the electrolyte. The scope of the claims is not believed to have been altered.

Claims 1-9 recite a fluorine gas generator having an inert gas substitution means for eliminating the hydrogen fluoride (HF) gas remaining in at least part of a HF gas feed line having an end connected to a HF gas inlet disposed in an electrolyte in an electrolytic bath, the part of the feed line being downstream from a first automatic valve on the HF gas feed line that is capable of being closed on the occasion of interruption of HF gas feeding. The structure disclosed in the specification as corresponding to this inert gas substitution means is the inert gas feed line 91 (Fig. 2) which connects the inert gas storage tank 92 to the HF feed line 24 downstream of the first automatic valve 82.

Significantly, however, although the present specification also discloses an inert gas line having valve 73 (Fig. 2) that connects the inert gas storage tank 92 to the HF feed line 24 upstream of the first automatic valve 82, this line does not correspond to the “inert gas substitution means for eliminating the hydrogen fluoride gas remaining in at least part of said line on the side downstream from said first automatic valve on said hydrogen fluoride gas feed line, which part is located downstream of said first automatic valve,” because this line would not function to eliminate HF gas remaining in line 24 downstream from the first automatic valve 82 when the valve is closed.

Similarly, the present specification also discloses a purge gas inlet for a purge gas to be supplied to the upper cover 17 of the electrolytic cell 1, to maintain a proper pressure (and

so the liquid level) in the cathode and anode chambers (sentence bridging pp. 6-7). However, this line also does not correspond to the “inert gas substitution means for eliminating the hydrogen fluoride gas remaining in at least part of said line on the side downstream from said first automatic valve on said hydrogen fluoride gas feed line, which part is located downstream of said first automatic valve,” because the inert gas introduced into the upper cover 17 of the electrolytic cell 1 is incapable of eliminating or purging HF gas in the HF gas feed line 24. This is because the end of the HF gas feed line is immersed (“disposed”) in the electrolyte, which electrolyte creates a barrier to block the entry of an inert gas in the cathode chamber into the HF gas feed line 24.

For the same reason, there is no dispute that the inert gas introduced into the cathode chamber 7 and anode chamber 5 of Tojo et al from the inert gas tank 18 to limit the liquid level therein, via the inlet ports 15 and 17 of the pressure keeping means 50, is not an “inert gas substitution means for eliminating the hydrogen fluoride gas remaining in at least part of said line on the side downstream from said first automatic valve on said hydrogen fluoride gas feed line, which part is located downstream of said first automatic valve.”

The Office Action has therefore relied on Saito et al to teach a purge gas supply device connected to a reactive gas feed line for a reactor. In particular, the Office Action relied on the nitrogen gas from sources 36a-36b, that purges the reactive gas supply pipes 31a-31b of Saito et al to prevent contamination of the atmosphere in the reactor tube 11 from residual reactive gas remaining in the gas supply pipes when a different gas is introduced into the reactor tube during the wafer coating process (col. 12, lines 40-49). According to the Office Action, it would have been obvious in view of Saito et al to have connected the inert gas feed lines 15, 17 of Tojo et al directly to the HF gas feed line of Tojo et al “to completely purge the apparatus including the HF feed line.”

As a threshold matter, it is respectfully submitted that such a combination would not have been obvious to one skilled in the art because Saito et al is not analogous prior art.

Analogous art is that which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his or her invention as a whole. MPEP § 2141.01(a). The Office Action deemed that Saito et al is analogous prior art because it uses inert gas for purging. However, the invention is not broadly the use of inert gas for purging; there is no dispute that this, *per se*, was well known in the art. Rather, the invention is directed to addressing the problem of ensuring that the purging gas reaches a portion of the HF feed line between an automatic valve on the HF gas feed line that is capable of being closed on the occasion of interruption of HF gas feeding, and the end of the HF gas feed line that is disposed in the electrolyte. Saito et al would **not** have logically commended itself to an inventor's attention in considering this invention as a whole, because Saito et al does not experience this problem: the ends of the reactive gas lines in Saito et al are not disposed in a blocking liquid, and so an inert purge gas in the reaction chamber could reach any portion of the reactive gas line downstream of the cut-off valves VB1 and VB2.

Indeed, the purported motivation mentioned in the Office Action for modifying Tojo et al, i.e., "to completely purge the apparatus including the HF feed line," demonstrates the non-analogousness of Saito et al. Why would Saito et al motivate one skilled in the art to modify the inert gas feed in Tojo et al to a combined purge gas/reactant gas line that will "completely purge the ... HF feed line" when that construction would not have been required to "completely purge the ... HF feed line" in Saito et al? In fact, one skilled in the art would **not** have been provoked by this "motivation" to incorporate the combined purge gas/reactant gas lines of Saito et al into Tojo et al because an inert purge gas in the reaction chamber of Saito et al could reach a portion of any of the reaction gas line downstream of a cut-off valve VB 1 or VB2, even without these combined N<sub>2</sub> purge/reactant gas lines.

Additionally, it is respectfully submitted that the modification proposed in the Office Action would not have been obvious to one skilled in the art because this modification would render the pressure keeping means 50 of Tojo et al unsatisfactory for its intended purpose. See MPEP 2141.01(V): “THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE.” The pressure keeping means 50 of Tojo et al selectively and individually feeds inert gas into the cathode chamber 7 and anode chamber 5 of Tojo et al from the inert gas tank 18 to limit the detected liquid levels in each of these chambers so that the gas discharge port 14, 16 for each chamber will not be blocked by liquid overflow (col. 7, lines 32-40). Modifying Tojo et al such that the inert gas is instead introduced via the HF gas line that is immersed in the electrolyte, as is proposed in the modification of the Office Action, would destroy this function since the inert gas would then simply be diffused into the electrolyte.

Finally, it was pointed out in the last response that the invention would not have been obvious from Tojo et al in view of Saito et al because it achieves the unpredictable result of preventing the inflow of the electrolytic bath into the HF feed line due to negative pressure in the HF feed line downstream of the automatic valve when the valve is closed, so that the HF feed line will not be closed by back-flowed and solidified electrolyte. This argument was traversed in the “Response to Arguments” portion of the Office Action.

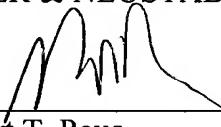
Regarding the first point of the “Response to Arguments,” beginning at the penultimate line on page 9 in the Office Action, it is noted that the aforementioned improved result would not have been predictable from the description of backflow prevention at lines 1-3 of col. 3 in Tojo et al because the backflow mentioned in this portion of the description is that into the gas discharge ports 14, 16 (col. 7, lines 32-40), not backflow into the HF feed line.

Moreover, as to the second point beginning at line 3 of page 10 in the Office Action, it is not predictable from the pressure keeping means 50 in Tojo et al, that instead combining the inert gas feed line with the HF gas feed line (as in the invention) would prevent backflow of the liquid into the HF gas feed line for reasons that are unrelated to the purpose of the pressure keeping means, e.g., due to a negative pressure resulting from closure of a valve in the HF gas feed line.

Applicants believe that the present application is in a condition for allowance and respectfully solicit an early notice of allowability.

Respectfully submitted,

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